Test Report n° TR_21078

Rapporto di prova n° TR_21078

Environmental testing – Test A: Cold

Prove ambientali – Prova A: Freddo

Ref: test procedure IL22001

Rif: procedura di test IL 22001

Product under testing ***Prodotto testato***	CPTOU4615 LS P3L3ARIO2H-4G1WTTSPFAEZ0
P/N ***P/N***	993202033501
Lab Sample ID ***ID campione***	20047
Received date ***Ricevuto il***	15/03/2021
Derived models ***Modelli derivati***	993202033500 / D_CPTOU4615 LS P3L3ARIEH------EZ0
Standard/Rev. Date/Ed. ***Standard/Data Revisione/Ed.***	**EN 60068-2-1:2007 – 2nd Ed.** – *Environmental testing – Part 2: Tests, Test A: Cold*
Manufacturer ***Costruttore***	AESYS S.p.A. Via Pastrengo 7c 24068 Seriate (BG) Italia Tel: +39.0352924111 www.aesys.com
Start test date ***Data inizio test***	19/04/2021
End test date ***Data fine test***	19/04/2021
First issue ***Prima emissione***	20/04/2021
Laboratory Technician ***Tecnico di laboratorio***	Sergio Fustinoni
Lab Manager ***Responsabile di laboratorio***	Marco Verzeroli
Verdict ***Esito***	**COMPLIANT**
Revision ***Revisione***	01
Revision date ***Data revisione***	26/04/2021

Revision	Reason	Name	Sign
01			

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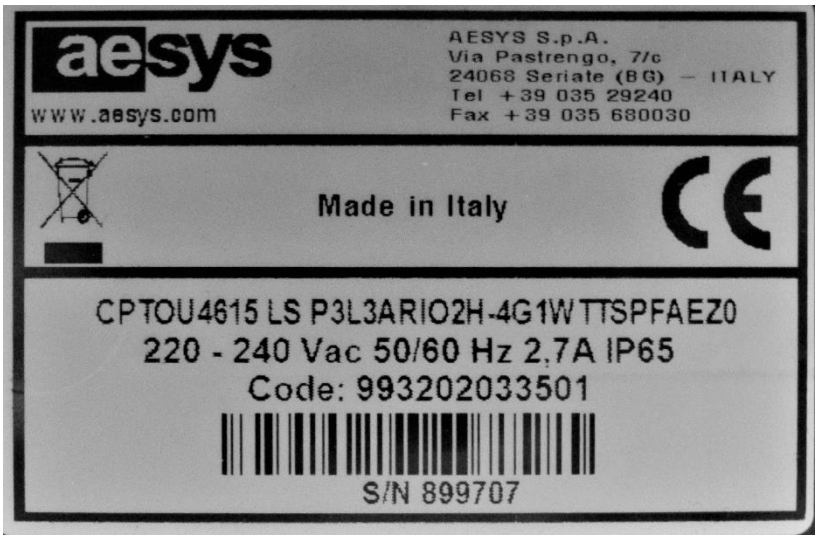
1 DUT – GENERAL PRODUCT INFORMATION
DUT – INFORMAZIONI GENERALI

The DUT (Device Under Test), CPTOU4615LSP3L3ARIO2H-4G1WTTSPFAEZ0, is a variable message panel based on TFT technology used for video-information in railways applications.

CPTOU4615 LS P3L3ARIO2H-4G1WTTSPFAEZ0



DUT – Product identification label

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2 TEST PROCEDURE
PROCEDURA DI TEST

Test performed according to Aesys internal procedure *IL 22001_Prova A - Freddo.*

3 TEST EQUIPMENT INFORMATION
INFORMAZIONI SULLA STRUMENTAZIONE UTILIZZATA

ID	Description	Model	Manufacturer	Serial n°	Last Calibration Date	Next Calibration Date
48	Climatic room	CH2000D	Angelantoni Industrie	7029	01/03/2021	03/03/2023
112	Data acquisition control unit	MX100	Yokogawa	91N427912	24/06/2019	25/06/2021
290 356	Data acquisition input unit	MX110	Yokogawa	91P527795 91S525693	24/06/2019	25/06/2021
142	Wattmeter	WT230	Yokogawa	91F611778	24/06/2019	25/06/2021

4 TEST PARAMETERS
PARAMETRI DI TEST

Test type: **Cold (Part 2-1 Test A: Suffix letter Ae)**

Test severity level: **Temperature (°C):**

- ☐ -65
- ☐ -55
- ☐ -50
- ☐ -40
- ☐ -33
- ☒ -25
- ☐ -20
- ☐ -10
- ☐ -5
- ☐ +5
- ☐ Custom:

Duration (h):

- ☒ 2
- ☐ 16
- ☐ 72
- ☐ 96

Environmental conditions:
Temperature range: 15°C to 35°C
Relative humidity: 25 to 75%
Pressure: 860 to 1060 hPa

Test measurements uncertainty: Temperature: ± 1°C

Measurement uncertainties estimated as extended uncertainty, obtained multiplying the standard uncertainty by the coverage factor *k* corresponding to a confidence level of about 95%.

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5 TEST SETUP
TEST SETUP

Test procedure according to EN 60068-2-1:2007 Clause 5.4.

Parameters and behaviors monitored:

Parameter/Behaviour	Evaluation criteria
Mechanical check	No mechanical damage, no cracks
Electrical check	No electrical failure, no abnormal power consumption
Display check	Correct visualization of the define image
Communication check	No loss of data communication, data exchanged are correct
Temperature	Temperature below the limit (if present)

List of thermocouples:

Channel	Position	Side
1	GLASS OUTER CENTER	GLASS
2	TOP SX EXTERNAL GLASS	
3	LOWER RH EXTERNAL GLASS	
4	INNER GLASS CENTER	
5	TOP SX INTERNAL GLASS	
6	LOWER RH INTERNAL GLASS	
7	TFT FRONT CENTER	TFT
8	TFT FRONT UPPER LEFT	
9	TFT FRONT TOP RH	
10	TFT LOW FRONT LEFT	
11	TFT LOW FRONT RH	
12	TFT REAR PROBE (SENSOR)	
13	PC PROBE SINK	INTERIOR DY
14	TEMPERATURE PROBE 1609	
15	PROBE POWER SUPPLY	
16	BOTTOM LEFT INTERIOR (EXCHANGER)	EXCHANGER
17	BOTTOM RIGHT INTERIOR (EXCHANGER)	
18	OUT UPPER INTERNAL LEFT (EXCHANGER)	
19	OUT TOP INSIDE RIGHT (EXCHANGER)	
20	LOW EXT LEFT (EXCHANGER)	
21	LOW EXT RIGHT (EXCHANGER)	
22	TOP EXT LEFT (EXCHANGER)	
23	TOP EXT RIGHT (EXCHANGER)	
28	EXTERNAL PROBE (CHAMBER TEMPERATURE)	CHAMBER

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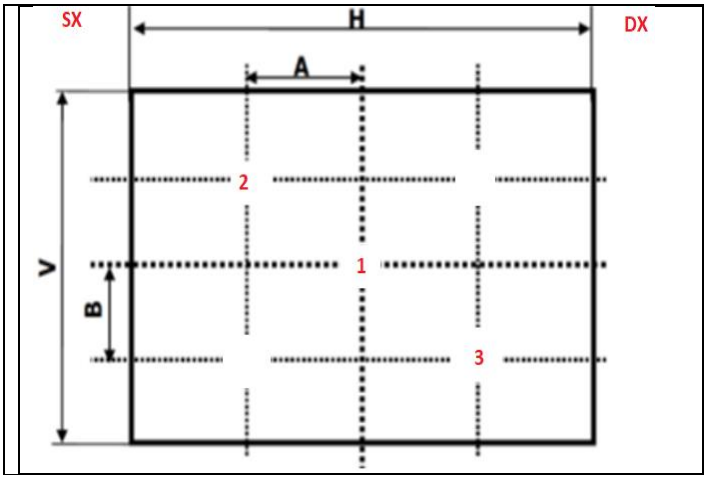
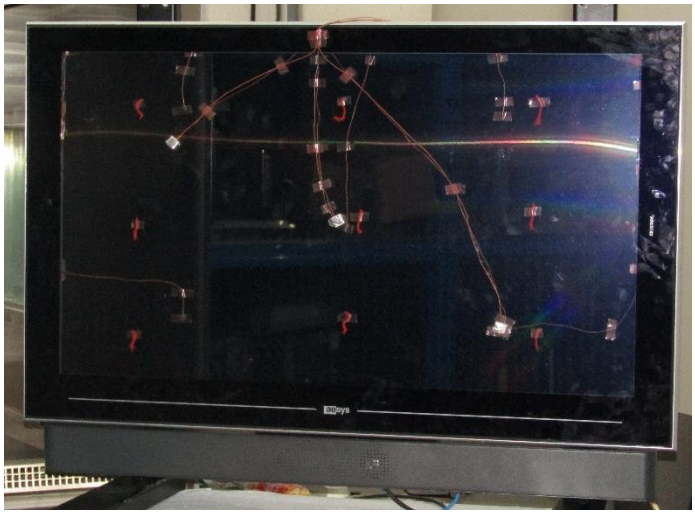
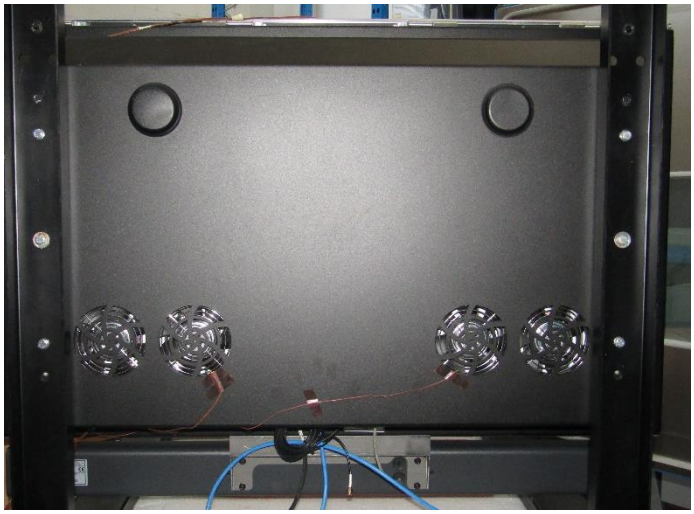
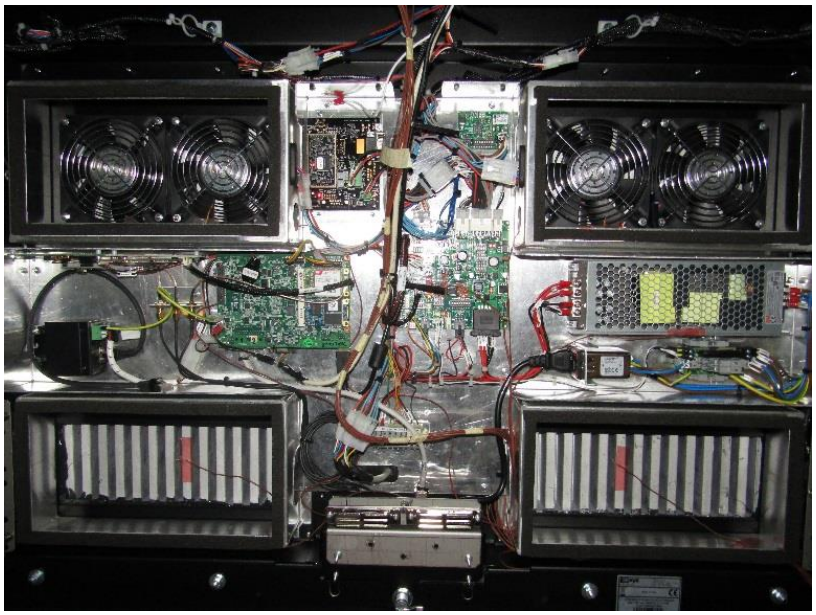
Thermocouples located in the following points:



Sx Observer = Sx Display
Dx Observer = Dx Display
A : H/4 mm
B : V/4 mm
@ H,V : Active Area







Thermocouples positioning

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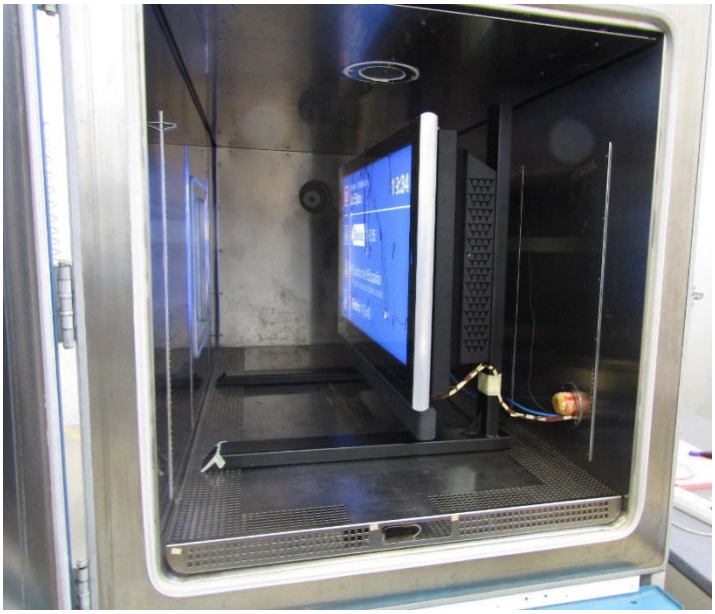
Test setup shown in the following pictures:



Test arrangement

6 TEST RESULTS
RISULTATI DEI TEST

6.1 Environmental conditions
Condizioni ambientali

Test	Performance criteria	Result	Verdict
Environmental temperature	Between +15°C and +35°C	21,4 °C	PASS
Relative humidity	Between 25% and 75%	31,7 %	PASS
Pressure	Between 860 and 1060 hPa	1011 hPa	PASS

6.2 Startup verification
Verifica iniziale

Test	Evaluation criteria	Result	Verdict
Mechanical check	No mechanical damage, no cracks	No mechanical damage	PASS
Electrical check	No electrical failure, no abnormal power consumption	Voltage: 223,0V Current: 0,6A Power: 112,8W	PASS
Display check	Correct visualization of the define image	No loss of visualization	PASS
Communication check	No loss of data communication, data exchanged are correct	Constant communication	PASS
Temperature	Temperature below the limit (if present)	No temperature limit	PASS

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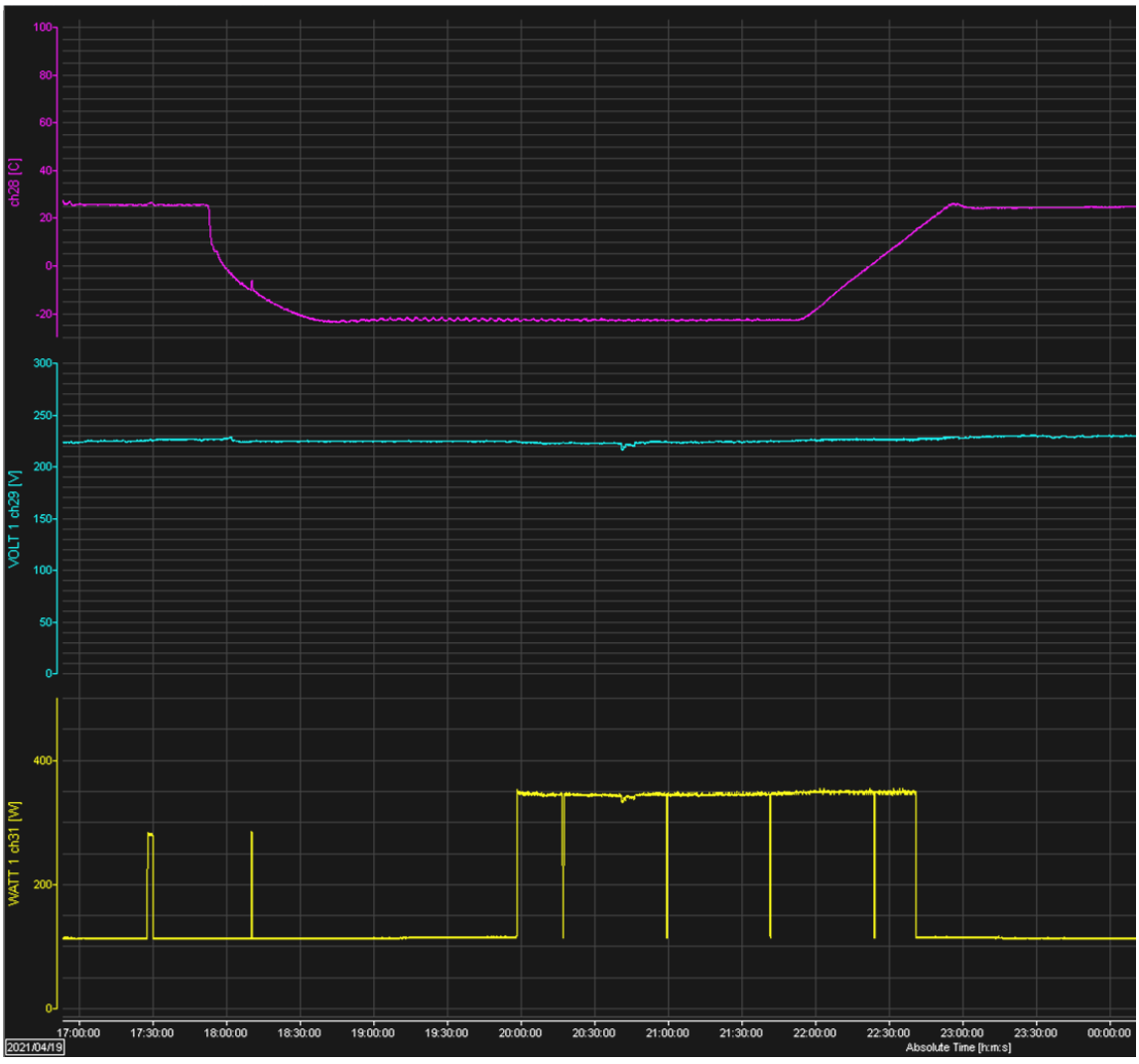
6.3 End test verification
Verifica al termine del test

Test	Evaluation criteria	Result/Comments	Verdict
Mechanical check	No mechanical damage, no cracks	No mechanical damage	PASS
Electrical check	No electrical failure, no abnormal power consumption	Voltage: 230.9V Current: 0,6A Power: 111,6W	PASS
Display check	Correct visualization of the define image	No loss of visualization	PASS
Communication check	No loss of data communication, data exchanged are correct	Constant communication	PASS
Temperature	Temperature below the limit (if present)	No temperature limit	PASS

6.4 Test data Test data
Dati del test

The following graph shows the internal temperature, the environmental temperature and the power measured during the entire thermal cycle.



Absorption details -Temp.-Volt- Watt

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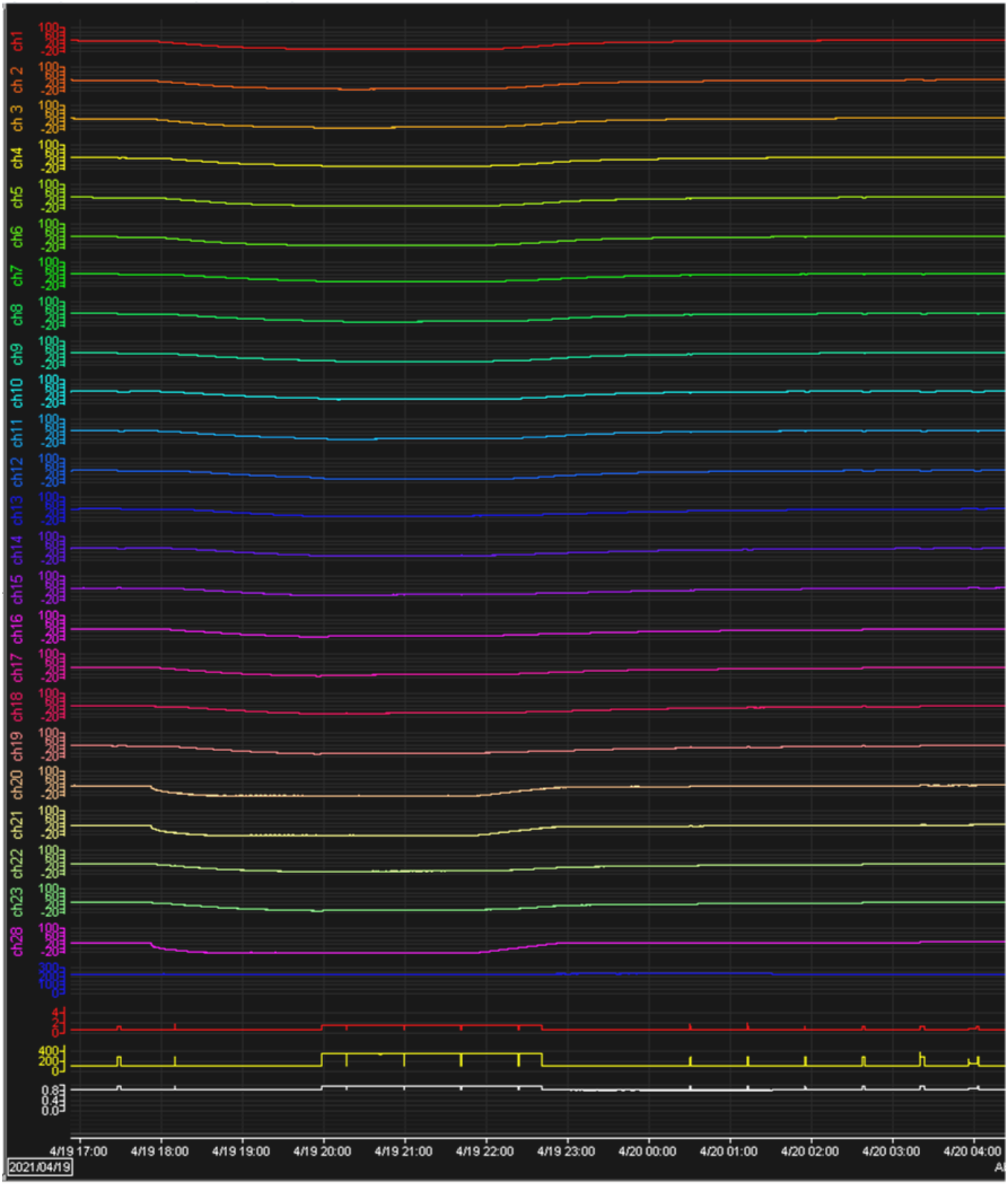

Graph of the measured temperatures

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The minimum temperatures are reported in the table hereunder:

Channel	Position	Min. temperature measured after steady state (°C)
1	GLASS OUTER CENTER	-9.6
2	TOP SX EXTERNAL GLASS	-10.4
3	LOWER RH EXTERNAL GLASS	-11.5
4	INNER GLASS CENTER	-6.7
5	TOP SX INTERNAL GLASS	-8.2
6	LOWER RH INTERNAL GLASS	-8.5
7	TFT FRONT CENTER	2.7
8	TFT FRONT UPPER LEFT	0.3
9	TFT FRONT TOP RH	-0.8
10	TFT LOW FRONT LEFT	1.0
11	TFT LOW FRONT RH	-0.1
12	TFT REAR PROBE (SENSOR)	-3.6
13	PC PROBE SINK	2.9
14	TEMPERATURE PROBE 1609	1.2
15	PROBE POWER SUPPLY	1.9
16	BOTTOM LEFT INTERIOR (EXCHANGER)	-7.1
17	BOTTOM RIGHT INTERIOR (EXCHANGER)	-10.6
18	OUT UPPER INTERNAL LEFT (EXCHANGER)	-2.0
19	OUT TOP INSIDE RIGHT (EXCHANGER)	-5.3
20	LOW EXT LEFT (EXCHANGER)	-23.5
21	LOW EXT RIGHT (EXCHANGER)	-23.7
22	TOP EXT LEFT (EXCHANGER)	-8.9
23	TOP EXT RIGHT (EXCHANGER)	-11.5
28	EXTERNAL PROBE (CHAMBER TEMPERATURE)	-23.7

Test	Evaluation criteria	Result	Verdict
Cold start test	No mechanical and electrical failure No loss of performance No thermal hazard	No mechanical and electrical failure No loss of performance No thermal hazard	**PASS**

6.5 Additional information / Notes:
Informazioni aggiuntive / Note:

END OF TEST REPORT
Fine del test report

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